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Comprehensive review of changing consumption and production patterns

Report of the Secretary-General*

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I. Introduction

1. The General Assembly, at its nineteenth special session, in June 1997, identified changing consumption and production patterns as an overriding issue in the implementation of Agenda 21 and as the cross-cutting theme selected for particular attention at the seventh session of the Commission on Sustainable Development.[1]

2. In its consideration of changing consumption and production patterns at the nineteenth special session, the General Assembly had before it a review of progress towards the implementation of the objectives defined in chapter 4 of Agenda 21 (E/CN.17/1997/2/Add.3). The General Assembly noted that since 1992 only marginal progress had been made in addressing unsustainable production and consumption patterns, and it identified a number of actions as a focus for future work by the international community.

3. The present report reviews progress in the implementation of the work programme on changing consumption and production patterns, which was adopted in 1995 by the Commission on Sustainable Development at its third session.[2] The report reviews work by the United Nations, other international organizations, Governments, business and industry, and other non-governmental organizations, with a particular focus on activities since the nineteenth special session, and proposes some refocusing of the work for the period 1999–2002 and beyond.

Box 1
The Commission's work programme on changing consumption and production patterns

A. Identifying the policy implications of projected trends in consumption and production patterns.

B. Assessing the impacts on developing countries of changes in consumption and production patterns in developed countries.

C. Evaluating the effectiveness of policy instruments.

D. Eliciting time-bound voluntary commitments from countries to make measurable progress.

E. Revising the United Nations guidelines for consumer protection.

Source: *Official Records of the Economic and Social Council, 1995, Supplement No. 12* (E/1995/32), para. 45.

4. The work programme on changing consumption and production patterns is intended for implementation by all concerned actors, including Governments and local authorities, the United Nations and other international organizations, business and industry, and organizations of civil society. This was true when the Oslo Ministerial Round Table on Sustainable Production and Consumption developed elements for the work programme in 1995, and it remains true today.[3]

II. Implementation of the work programme on changing consumption and production patterns

5. Efforts to change consumption and production patterns have gained considerable momentum in recent years, and have involved increasing numbers of concerned stakeholders. Developed countries have generally taken the lead in studying ways to change unsustainable patterns of consumption and production, but developing countries have also shown concern and interest in the question. Brazil, the Netherlands, Norway and the Republic of Korea are among the countries that have actively contributed to progress on the work programme. Business and non-governmental organizations in both developed and developing countries have also contributed to the work.

Box 2
Contributions to the discussion on changing consumption and production patterns in 1998

"The twentieth century explosion in consumption has ... greatly advanced human development. But it has bypassed many of the world's poorest people. Inequalities are growing, and the natural systems on which all people depend are more endangered" (United Nations Development Programme (UNDP), *Human Development Report, 1998*)

"Sustainable consumption requires that consumers, communities, businesses and organizations of civil society be aware of the potential environmental effects of products and services, including local and global impacts" (Report of the Co-Chairmen on an interregional expert group meeting on consumer protection and sustainable consumption, São Paulo, January 1998)

"... achieving sustainable development is a collective responsibility. Action to protect the global environment must include the adoption of improved sustainable consumption and production practices" (United Nations Environment Programme (UNEP), International Declaration on Cleaner Production, 1998)

"World Business Council for Sustainable Development (WBCSD) companies see no merit in the 'reduction vs. business as usual' debate. Rather they take the view that *different* conduct of business in the market is the way forward. Therefore, the business-based approach of WBCSD to sustainable consumption and production is 'sustainability through the market'." (WBCSD, "Sustainability through the market", December 1998)

"Sustainable consumption is only as difficult as we make it. There are many things that could be put into action now. Let's do it!" (Participant in a workshop on consumption in a sustainable world, Kabelvåg, Norway, June 1998)

6. Progress has continued on the implementation of a number of international agreements with implications for consumption and production patterns. Such agreements now cover greenhouse gas emissions, the ozone layer, desertification, biodiversity, the export of hazardous waste, international fisheries and marine pollution. In addition, significant progress has been made in the areas of sustainable forest management, fresh water and the sustainable development of small island developing States.

7. Much of the work on changing consumption and production patterns, particularly in developed countries, has been related to the issue of climate change and the implementation of the 1992 United Nations Framework Convention on Climate Change and the Kyoto Protocol to the Convention of December 1997. The implementation of reduction commitments for carbon dioxide (CO_2) and other greenhouse gases will require substantial changes in production and consumption patterns, particularly in developed countries, especially in the use of fossil fuels. Elaboration and implementation of the mechanisms for international cooperation, in particular the financial mechanism and the clean development mechanism, in accordance with the Buenos Aires Plan of Action adopted by the Conference of Parties to the Convention at its fourth meeting, in November 1998, could substantially increase international cooperation in promoting sustainable production and consumption patterns in all countries.

8. Work at the national and international levels in recent years has focused on a number of promising strategies for changing consumption and production patterns, including internalizing environmental and social costs in market prices, removing subsidies for unsustainable production and consumption activities, and integrating environmental and social goals in economic policy-making. Work is also under way on increasing the efficiency of energy and resource consumption, the development and use of indicators for sustainable consumption and production, stakeholder participation, voluntary initiatives and agreements, education and information, trend analysis and projections, and further development of such concepts as eco-efficiency, factor 4/10,[4] eco-space, ecological footprints and carrying capacity.

9. A substantial contribution to the debate on sustainable consumption patterns was the UNDP *Human Development Report, 1998*[5] which focused on the theme "Changing today's consumption patterns — for tomorrow's human development." The *Report* illustrated how poor households and communities bear many of the economic, environmental and social costs of unsustainable consumption and production, and noted that the gap between rich and poor is growing.

10. An international workshop on the theme "Consumption in a sustainable world" was held at Kabelvåg, Norway, in June 1998, hosted by the Government of Norway. The workshop had the objectives of accelerating international action and building partnerships between developed and developing countries. The meeting focused on practical examples of efforts to promote sustainable consumption in all regions of the world, bringing together pioneers from business, government and citizen organizations. Examples from Austria, China, Colombia, Egypt, India and the United Kingdom of Great Britain and Northern Ireland demonstrated that the issue of sustainable consumption is getting beyond academia and the conference hall and into communities and the marketplace (see also box 6).[6]

11. A regional expert meeting on the theme "Sustainable consumption patterns: trends and traditions in East Asia" will be hosted by the Republic of Korea, in cooperation with the Division for Sustainable Development of the United Nations Secretariat, in late January 1999. This meeting will assess trends in East Asia, based in part on the indicators developed as part of the work programme on changing consumption and production patterns. The

meeting will also discuss regional concerns and impacts, and the cultural and social aspects of sustainable consumption.

12. A world conference on international cooperation of cities and citizens for cultivating an eco-society was hosted by the Tokyo metropolitan government in May 1998, focusing on the role of cities in promoting more sustainable consumption and production patterns. The results of the conference, including examples of good practices, are available in a printed summary (see ST/TCD/SER.E/57), on a CD-ROM issued by the Tokyo metropolitan government and on the Internet.[7]

13. UNEP, through its Cleaner Production Programme, and the Organisation for Economic Cooperation and Development (OECD), through its work on sustainable consumption, eco-efficiency and indicators, have also made substantial contributions to progress on the work programme for changing production and consumption patterns. The UNEP International Declaration on Cleaner Production will be open for signature by participants at the seventh session of the Commission on Sustainable Development.

14. Progress on particular elements of the work programme, with particular emphasis on the activities and events since the nineteenth special session of the General Assembly, in June 1997, is reviewed below.

A. Trends in consumption and production patterns

15. Consumption of energy and natural resources is growing steadily, driven by economic development and population growth. Consumption patterns are also influenced by social values, technological developments and urbanization, which often promote consumption by creating new needs and aspirations. Some critical trends, in particular with regard to the Commission's work programme for 1999–2001, are described in the present section.

16. The complexity of the sustainable development process and the interactions between economic, social and environmental factors make it difficult to project future trends and assess the impact of proposed policy measures. Computer modelling offers a promising technique for analysing the complex interactions involved but is still largely at the research stage. Modelling is most advanced in the field of global warming and climate change, and those models are gradually being developed and linked to other models to take account of demographic trends, land use changes, economic development projections and freshwater supplies, as well as atmospheric and oceanic factors. Those models are being incorporated into modelling frameworks which are increasingly able to address broader issues of sustainable development.

17. Further work is needed on the applications of global modelling for projections of future trends, the analysis of potential policy impacts and long-term strategic planning. Modelling in the past has largely focused on developed countries, whose production and consumption patterns have the greatest impact on global climate. Further work is needed to apply those models to developing countries and to increase the capacities in developing countries to participate in modelling work.

18. *Green Business Opportunities*, a magazine issued by the Confederation of Indian Industry, recently published a special issue on sustainable consumption, emphasizing that it is in the interest of all people and all countries to address the negative environmental effects of economic growth, urbanization and industrialization. It argued that all countries have a great deal to gain from sustainable consumption, and that national industries have an important role to play.[8]

1. Agriculture and fisheries

19. About 75 per cent of human food consumption is supplied through agriculture, with the other 25 per cent being supplied through fisheries and hunting and gathering. With population growth and a limited potential for expanding cultivated land, the area of cropland per capita in the world has declined steadily, from about 0.43 hectares (ha) in 1961 to about 0.26 ha in 1996. Nonetheless, global food production and consumption has grown faster than population growth as a result of improved crop varieties and production techniques, and increased use of fertilizers. Meat consumption per capita has also increased, as has the world's livestock population.

20. It is expected that food production can continue to grow faster than population, leading to further improvements in the amount and variety of food available. However, the increasing use of inorganic fertilizers is resulting, in some areas, in the contamination of drinking water with nitrates and damage to aquatic ecosystems from eutrophication, with particular harm to coastal fisheries from algae blooms ("red tides" and "brown tides"). Until recently, this was mainly a problem in developed countries, but it has now become a problem in Asia as well due to rapid increases in inorganic fertilizer use in that region.[9] In contrast to industrial sectors, where energy and resource efficiency have improved, the agricultural sector has increased energy and fertilizer use per unit of production.

21. Global fish production has increased from about 18 kilograms (kg) per capita in 1985 to about 21 kg per capita in 1996, with about 74 per cent of that used for direct human consumption. Per capita fish consumption is highest in developed countries, but most human fish consumption occurs in developing countries. Subsistence fishing and local markets are central to food supplies in many low-income countries. Growth in fish production and consumption in recent years has been mainly due to growth in aquaculture, which provides about 26 per cent of fish for human consumption. The marine fish harvest has stagnated at about 13 kg per capita in recent years.[10]

22. The growth rates of fish production and consumption of recent decades will probably not be sustained. Overfishing, pollution and disturbance of marine habitats have reduced the productivity of many marine fisheries. Many commercial fish stocks in the northern hemisphere are overfished, and pressure is rising on the stocks in southern regions. Aquaculture fish production, while it is expected to grow, will probably not fully make up for stagnant or declining marine fish harvests. Coastal aquaculture will need to be better regulated, in particular to reduce water pollution, ecosystem disruption and other environmental degradation. Fish prices are expected to rise, reducing the availability and affordability of fish for low-income families in developing countries.

2. Energy

23. In most industrialized countries, there has been continued progress in reducing energy and material consumption per unit of production. There has also been reduced energy and material consumption per unit of gross domestic product (GDP) due to the continuing shift from manufacturing-based to service-based economies. However, the improvement in efficiency per unit of production has been offset by increases in the volume of production and consumption, leading to continued increases in total energy and materials consumed.

24. Current growth in energy consumption is driven in part by declining oil prices, which fell to about $10 per barrel in December 1998, down from about $20 per barrel earlier in the year. If current trends in energy and fossil fuel consumption continue, by 2010 global energy consumption and CO_2 emissions will have risen by almost 50 per cent above 1993 levels.[11] There is general agreement that further increases in energy and material efficiency

in production processes will need to be combined with shifts in consumption patterns towards goods and services that are inherently less energy and resource intensive if greenhouse gas emissions are to be stabilized.

25. Developing countries, with 80 per cent of the world population, consume about one third of the world's energy, a share which would grow to about 40 per cent by 2010 if current trends continue. In rural areas of developing countries, however, continued lack of access to commercial energy sources is a serious constraint on economic and social development. Poverty and distance from supplies leave communities dependent on fuelwood or animal dung for cooking and heating. Such traditional fuels, in addition to constraining development, create indoor air pollution, with serious impacts on human health.

26. Renewable energy, although still providing only a small share of commercial energy, is becoming an important growth market, with particular potential in developing countries. It is anticipated that a significant proportion of the roughly 2 billion people in the world who do not now have access to electricity could be most economically served by small-scale, off-grid generating systems based on renewable energy sources. In this vast market, which extends to rural industries as well as households, renewable energy sources, such as solar photovoltaic (PV) energy, wind turbines, micro-hydropower and biomass, will become less expensive as costs decline with rising economies of scale.

27. One recent programme for promoting renewable energy sources in rural areas of developing countries is the World Bank's PV market stimulation project, focusing on India, Morocco and Kenya. The project supports rural electrification programmes while stimulating economies of scale in the production of PV panels and building capacities in solar energy industries.

28. The Hilly hydropower project in India, funded by the Global Environment Facility (GEF), supports the development of small hydropower resources in the Himalayan and sub-Himalayan regions. The technology transfer component has trained Indian engineers in the United Kingdom as well as in the region itself. Assistance was provided to local partners for the development of appropriate ownership, management and maintenance systems.[12]

3. Transportation

29. Motor vehicles account for 15 per cent of global fossil fuel consumption and CO_2 emissions, and 80 per cent of transport-related energy consumption. Since the early 1970s, the global fleet of cars, trucks and buses has been growing by 16 million vehicles per year to a total of 630 million in 1994. If this growth continues, the world will have 1 billion vehicles on the road by 2025.[13] In addition, consumers are driving more and are tending to buy less fuel-efficient vehicles, in part as a result of low gasoline prices. In the United States of America in 1998, consumers continued to shift from cars to sports utility vehicles, vans and pick-up trucks, which are less fuel efficient and more polluting than cars. Those trends in consumption are outpacing improvements in fuel efficiency.

30. Improvements are continuing, however, in reducing pollution emissions from new cars. A new model of the Ford Ka, for example, produces only 2 per cent of the emissions of a 1976 model of the Ford Fiesta. In 1999, Volkswagen will start selling a 3-litre Lupo, consuming less than 3 litres of fuel per 100 kilometres. Cleaner and more fuel efficient alternatives to the conventional internal combustion engine are also being developed. Toyota has introduced the Prius, a hybrid gasoline/electric powered vehicle that doubles fuel efficiency in urban driving compared with conventional internal combustion engines. In the United States, General Motors is selling and leasing the EV-1 electric car, which produces no emissions.

B. Policy measures for changing consumption and production patterns

31. Governments in both developed and developing countries are examining policies for improving producer and product performance and for changing consumer demand. The present section reviews a number of policy instruments and strategies that have been developed to encourage changes in the behaviour of producers and consumers. It focuses on new and innovative instruments intended to improve energy and material efficiency and waste management in industry and the public sector, and to encourage more sustainable consumer behaviour. These new policy instruments are generally most effective when used in conjunction with more conventional environmental protection regulations.

32. The Division for Sustainable Development, in cooperation with the International Institute for Sustainable Development, established in 1997 a database on new and innovative policy instruments for changing consumption and production patterns. The database, now in its initial stage, lists more than 100 instruments. The database is accessible at http://iisd.ca/susprod/, and Governments, international organizations and major groups are encouraged to contribute additional examples.

1. Economic instruments

33. Economic policy instruments are increasingly being used in both developed and developing countries to promote sustainable consumption and production. Those instruments include taxes, tradable permits, deposit-refund systems and other market-based mechanisms. In many cases, such economic incentives are most effective when combined with regulatory and social instruments. OECD and other international bodies have recently published a number of analytical reviews of economic instruments.[14]

34. A variety of material and waste taxes have been established in a number of countries to encourage more efficient use of resources, discourage the use of certain substances and discourage the use of disposable products. In many cases, however, taxes have been too low to have a significant impact on producer or consumer behaviour, and have served mainly as revenue-raising measures. Consumption patterns in the transportation sector have been particularly difficult to address through taxation. In general, taxes are generally most effective if they are part of a comprehensive policy package targeted at a specific objective. Reviews of environmental taxes have recently been published by OECD and the European Environment Agency.[15]

35. Major obstacles to the implementation of a tax regime favouring sustainable consumption and production are political opposition to taxes and concerns about international competitiveness. In some cases, those issues can be addressed by explicitly linking new or increased environmental taxes with equivalent tax reductions in other areas. Some countries, such as Germany, the Netherlands, Norway and Sweden, are shifting taxes from labour to natural resources in order to promote employment while improving resource efficiency and reducing pollution.

36. Tradeable emissions quotas, within a regulatory ceiling on total emissions, have proven quite successful in the United States in reducing sulphur dioxide (SO_2) emissions while allowing power plants flexibility in adapting to the new requirements. Tradeable water rights have been used in the United States and Chile to promote efficient use of water resources. The Kyoto Protocol provides for emissions trading as well as other flexible mechanisms to ensure that global greenhouse gas reduction targets are met while allowing countries flexibility in making the necessary changes to production and consumption patterns.

37. Further study is needed on the practical effectiveness of economic instruments as a means of changing consumption and production patterns. This will require surveys and case studies over a period of time to examine their impact under different social and economic conditions, their political feasibility, the speed at which producers and consumers adapt to such incentives, and their effectiveness in combination with other policy instruments.

2. Reducing environmentally harmful subsidies

38. Among the major obstacles to sustainable consumption and production are subsidies for environmentally harmful practices, providing economic incentives for inefficient and unsustainable use of energy and natural resources. Estimates of such subsidies worldwide have ranged from about $650 billion to about $1.5 trillion per year, even after the reductions in such subsidies in recent years.[16] It might be noted that this is substantially greater than the $600 billion per year estimated as the total cost of implementing Agenda 21. Examples include subsidies for energy consumption, coal production, water, fishing, fertilizer, agricultural production and motor vehicle transportation. There is growing recognition that such subsidies are undesirable and should be eliminated.

39. Recent years have seen some subsidy reductions, although often more for economic or political reasons than for environmental protection. The Russian Federation, Eastern European countries, China and India have reduced fossil fuel subsidies by an average of about 60 per cent. New Zealand has eliminated virtually all of its agricultural subsidies, and the European Union and the United States have plans to do the same.

40. However, there is often strong opposition to subsidy reductions. The major beneficiaries of such subsidies are generally privileged and politically influential groups, which makes subsidy removal politically difficult. Analyses generally reveal that only a small proportion of production subsidies go to low-income people.

41. For political, economic and social reasons, it may be necessary to phase out subsidies gradually, to transform subsidies into equivalent but environmentally friendly benefits to the affected group, or to introduce measures to protect disadvantaged groups. Further work is needed on identifying effective measures for removing environmentally harmful subsidies without creating economic, social or political problems.

3. Eco-efficiency and cleaner production

42. The concept of eco-efficiency was originally coined by the business community to mean production of goods and services with less resource consumption and less pollution. Eco-efficiency was seen as a strategy to make businesses more competitive and more innovative, while becoming more environmentally responsible.[17] OECD has identified eco-efficiency as a promising policy development strategy for businesses, Governments and households. Eco-efficiency strategies can be enhanced by setting targets and making eco-efficiency part of a comprehensive policy package.[18]

43. Industry pioneers have shown that substantial financial benefits can be achieved through better management of energy and materials. Such concepts as eco-design, waste recycling, cogeneration of heat and power, and zero waste (or 100 per cent product) are increasingly being implemented, with both economic and environmental benefits.

44. Governments can play a major role in promoting eco-efficiency at the firm and household level and in government operations. Policies to promote eco-efficiency and cleaner production include environmental regulations, economic incentives, support for the development of substitutes for environmentally harmful materials and processes, and encouragement of life cycle analyses of the environmental impact of products. Governments

can also promote the adoption by business and industry of environmental management and accounting systems, performance reporting and extended producer responsibility.

Box 3
Seven characteristics of eco-efficiency

1. Reduce the material intensity of goods and services.
2. Reduce the energy intensity of goods and services.
3. Reduce toxic dispersion.
4. Enhance product recyclability.
5. Maximize sustainable use of renewable resources.
6. Improve product durability.
7. Increase the service intensity of goods and services.

Source: WBCSD, December 1998.

45. The "Factor-10 Club" argues that the use of energy and materials per unit of production can and should be reduced by a factor of 10 in industrialized countries over the next 30 to 50 years. This would substantially reduce consumption of natural resources and CO_2 emissions while allowing sustainable economic development. While "factor 10" and the intermediate target of "factor 4"[4] are useful concepts to mobilize public and political support and illustrate the changes that are needed for sustainability, they need to be adapted to particular sectors, products and processes.

46. International transfer and adaptation of technologies to promote cleaner, more resource-efficient production, particularly in developing countries, can be increased through collaboration between the public and private sectors. Governments in both developed and developing countries and international organizations can promote partnerships between enterprises in developed and developing countries. There is a particular need for assistance to small and medium-sized enterprises (SMEs) in developing countries in identifying new technologies and establishing alliances with developed country partners through such means as joint ventures, supplier contracts, coproduction agreements, direct investment and distribution arrangements.

47. The United States Agency for International Development (USAID) Initiative for Environmental Technology promotes firm-to-firm linkages between United States and Latin American companies. Among the priorities is the promotion of clean energy technologies and energy efficiency management. The United Kingdom Technology Partnership Initiative has promoted productive partnerships between United Kingdom firms and companies in developing economies through the development of a network of potential suppliers and users of environmental technology and services. The UNEP/United Nations Industrial Development Organization (UNIDO) national cleaner production centres have assisted a variety of enterprises in developing countries in identifying, transferring and adapting clean, energy- and resource-efficient technologies with both economic and environmental benefits.

Some of those centres are assisting small and medium-sized enterprises in preparing loan applications for financing the technology improvements.

48. Further efforts are needed to promote transfer of technology for eco-efficiency and cleaner production in developing countries, with particular attention to financing mechanisms and sustainable development policies, including economic incentives and environmental regulations, that encourage enterprises in developing countries to increase eco-efficiency and reduce pollution.

4. Voluntary initiatives and agreements

49. In promoting sustainable production and consumption through mandatory regulations, Governments often encounter difficulties in formulating standards that meet objectives and are perceived as economically feasible for business. Voluntary approaches to promoting sustainable production and consumption among businesses and other public and private organizations can be effective in identifying and implementing improved production processes and products efficiently and flexibly without imposing excessive burdens on enterprises.

50. A recent OECD study[19] examined the effectiveness of voluntary programmes and negotiated agreements. The study found that both perform modestly with respect to environmental effectiveness but provide low incentives for innovation and appear to be weakened by their lack of credibility with the public. Nonetheless, they may be cost-effective, generating significant "soft effects", such as information dissemination, innovation diffusion and awareness raising. Like other policy options, such agreements tend to be most effective when combined with regulations and other policies.

51. In the Netherlands, a pioneer in the use of negotiated, legally binding, public-private environmental agreements or "covenants", the experience of the first five years indicates that many of the targets for reducing emissions will be reached or exceeded and that cost-effectiveness is high. The covenant process has proven more effective than the regulatory process, allowing for more flexible implementation and encouraging businesses to take responsibility for environmental protection. Such instruments are not a universal solution, and after the "low-hanging fruit" is picked, further progress may be slower.[20]

52. In Indonesia, under the Proper Prokasih programme, the Government grades companies based on their performance in meeting wastewater quality standards and makes that information publicly available. Many facilities given poor grades ("black" or "red") have been induced to improve their performance, although others have not responded to such pressures.

53. International efforts in the business community towards voluntary standards include the development of environmental management systems and performance standards. Through the International Organization for Standardization (ISO), almost 5,500 enterprises have obtained certification for environmental management systems in accordance with ISO 14001 standards (e.g., Japan 1091, United Kingdom 650, Germany 620, Republic of Korea 250, United States 190). Almost 2,000 companies are registered under the European Union Eco-Management and Audit Scheme (EMAS).[21] The EMAS programme is currently undergoing renewal, and the new EMAS will be expanded beyond the industrial sector and will encourage stakeholder dialogue. The business community is also exploring issues related to corporate social responsibility. The Council on Economic Priorities has developed the SA 8000 standard to apply ISO 14000 management system criteria to socially responsible production.

54. Many multinationals, in particular those linked to WBCSD, have contributed to the development of cleaner and more efficient production processes. Also significant are some of the major changes in "doing business" at the Chief Executive Officer level of several leading corporations. Some industries are going beyond compliance and taking the lead in more sustainable production, including eco-efficiency and cleaner production, performance standards, public reporting, supply chain management, corporate social responsibility and eco-design. New concepts for doing business are being pioneered, with such corporations as British Petroleum, Interface and Xerox re-evaluating processes and products and focusing on services to consumers, for example by providing energy services instead of selling oil, or floor covering services instead of selling carpets. With such approaches, enterprises have an incentive to reduce rather than increase consumption of energy and resources.

55. The Commission on Sustainable Development, at its sixth session, called for a review of voluntary initiatives and agreements. As a first step, the Commission requested that representatives of industry, trade unions and non-governmental organizations identify the elements for such a review. A meeting is being planned to be held at Toronto in March 1999 to elaborate a set of recommendations to the Commission on the elements for the review.

5. Indicators

56. Indicators of trends in sustainable development are required for effective policy-making and evaluation of progress, in particular progress in meeting targets. Under the Commission's work programme on indicators for sustainable development and work programme on changing consumption and production patterns, a preliminary core set of indicators have been developed for consumption and production patterns, based on an expert group meeting held at the United Nations in March 1998. That set includes both indicators of resource use, covering consumption of energy, water, materials and land use, and indicators of consumer behaviour, covering mobility, food, buildings, recreation and consumer goods. The results of the expert group meeting and the set of indicators are available in a document entitled "Measuring changes in consumption and production patterns: a set of indicators" (ST/ESA/264). Methodologies for those indicators are currently being developed with the help of a number of "lead agencies", and testing at the national level is being planned.

57. Several other international organizations have also initiated work in the area of indicators of consumption and production, including UNEP, OECD, the European Environment Agency and the Statistical Office of the European Communities (Eurostat). OECD established a set of indicators on sustainable consumption in 1998, in part to support the analysis and evaluation of member country policy-making on sustainable consumption as part of OECD environmental performance reviews.

58. The United Kingdom has developed a set of indicators for raising awareness of sustainable consumption issues among the general public. The "headline" indicator set provides a barometer of quality of life in Britain, and includes economic indicators (growth, social investment, employment), social indicators (health, education, housing), environmental indicators (climate change, water quality, transport, wildlife and land use) and resource use indicators (waste). A key objective of this set of indicators is to give the public feedback on consumer behaviour and to increase understanding of how consumer choice contributes to sustainable development.[22]

6. Environmental accounting and valuation

59. The integration of economic and social development and environmental protection will require careful analysis of the costs and benefits of various policies and activities. A

number of countries are introducing "green national accounts" as "satellite accounts" to conventional national accounts in order to allow the benefits of resource conservation and environmental protection to be reflected in national economic indicators. The United Nations, in 1993, introduced the System of Integrated Environmental and Economic Accounting (SEEA) to assist Governments in that process. At the enterprise level, companies are introducing environmental accounting as a means to improve efficiency in the use of energy and resources, reduce waste, ensure compliance with environmental regulations and reduce pollution. A number of Governments are actively promoting the use of environmental accounting by enterprises. Efforts to develop common standards are under way in the United Nations Ad Hoc Expert Group on International Standards of Accounting and Reporting and elsewhere.

60. To promote the inclusion of services provided by the environment in economic analysis, a team of researchers from the United States, Argentina and the Netherlands has made a preliminary estimate of the total value of global eco-system services. Their estimate was a minimum value of $33 trillion per year (1994) for ecological services that are not normally measured in GDP, significantly more than total conventional global production of goods and services of $25 trillion a year.[13]

61. A study in India estimates annual costs of environmental degradation in that country to be between $10 billion and $14 billion a year, or 4.5 to 6 per cent of GDP in 1992. Inadequate provision of safe water is estimated to cost India $5.7 billion a year in health costs; soil erosion and deforestation losses are estimated at $2.5 billion a year; and urban air pollution is estimated to cost $1.3 billion a year.[23] Further work is needed on developing such indicators and integrating them into economic analysis.

7. Public procurement, operations and infrastructure

62. The need to change consumption patterns applies to public as well as private consumption. A number of Governments, local authorities and international organizations are developing green public procurement and operations policies to ensure that their operations are environmentally sound and to help build markets for environmentally friendly goods and services. Green policies include recycling and procurement of recycled and recyclable products, energy conservation, construction of energy-efficient buildings, and low-emission vehicles for public transport fleets.

63. In 1995, in cooperation with UNEP and the United States Environmental Protection Agency, UNDP introduced its "Green" Office Initiative to ensure a healthy and productive working environment, contribute to sustainable development and environmental protection, and propagate the culture of environmental concern. The Initiative includes policies and actions to rethink requirements to reduce environmental impact, reduce material consumption, recycle materials and waste, and reduce energy consumption.[24]

64. Sustainable consumption depends on the options available to consumers, which in turn depend on public infrastructure and services as well as on private sector production. Consumer recycling, for example, is most efficient when it includes a broad variety of materials and is part of municipal waste collection services. Convenient, efficient and attractive public transportation systems allow people to use their cars less. In some countries, public or publicly regulated utilities offer consumers access to energy from renewable energy sources at a modestly higher price.

8. Education, consumer information and social values

65. Efforts to strengthen social values supporting sustainable consumption have focused on education, awareness-raising and consumer information. A recent OECD workshop on education and sustainable consumption concluded that sustainable consumption can have a deep personal and social significance, and that the concept of sustainable consumption can be a useful introduction to education on sustainable development. Sustainable consumption can be promoted through educational approaches such as critical thinking, self-reflection, skills in media analysis, personal and group decision-making and problem solving. Education can also benefit from analysis and debate on the concept of sustainable consumption.

66. Labelling of products with information on their environmental impacts is an important mechanism for enabling concerned consumers to make environmentally sound choices. Although the development of eco-labelling has slowed since the "green consumer" wave of the 1980s, there have been some increases in eco-labelling in recent years, particularly in Northern Europe and East Asia. There is also increasing demand for consumer information relating to product sourcing, manufacturing and environmental impact at all stages along the production-consumption chain. As such concerns increase, some producers are using sustainable production information as a marketing tool. Voluntary initiatives, such as the Forest Stewardship Council and the newly established Marine Stewardship Council (MSC) promote more sustainable resource management and include on-product labels. The MSC logo will be on the market in early 1999, certifying fish from both developed and developing countries that are caught in environmentally appropriate, socially responsible and economically viable ways.[25]

67. To study the social, cultural, ethical and institutional dimensions of sustainability, the Oxford Centre for the Environment, Ethics and Society at Mansfield College, Oxford, is setting up an international commission on sustainability with a mandate to look specifically at the sociocultural dimensions that shape consumption and production patterns (see box 4).

68. Participants at a UNEP high-level seminar on cleaner production (September–October 1998) identified marketing, advertising and media as important elements that play a role in shaping consumption patterns. The UNDP *Human Development Report, 1998*,[5] noted that media and advertising have a direct influence on consumer lifestyles and impact the behaviour of people, in particular children. A typical United States consumer spends more than 1,000 hours over the course of a lifetime watching some 150,000 advertisements. American companies spent more than $100 billion on advertising in 1997, paying up to $8,000 per second of television airtime. Policy makers can be more effective if social marketing is included in the policy package, and advertising and media are considered as factors in the policy development process. An example is the measures and agreements between the United States Government and the tobacco industry, which require the tobacco industry to fund anti-smoking campaigns. A workshop to be organized by UNEP in cooperation with the Division for Sustainable Development in January 1999, with participants from the advertising industry, will address these issues. A follow-up workshop with policy makers on advertising and its role in shaping consumption patterns is planned for later in 1999.

Box 4
The Oxford Commission on Sustainability

The Commission will examine ways in which patterns of consumption may have to change if the quality of life is to be preserved and enhanced without irreversible damage to the environment. It will draw up an action plan of practical steps that can be taken by Governments, businesses, other organizations and individual citizens. The action plan will be submitted to the international review of progress towards sustainable development in 2002, 10 years after the United Nations Conference on Environment and Development (UNCED) of 1992. The Commission will be chaired by John Gummer, former United Kingdom Secretary of State for the Environment. It will be made up of 15 to 18 eminent individuals drawn from Governments, industry, the media, non-governmental organizations and universities around the world, and will start its work in early 1999. The programme will include four main elements:

1. Understanding the social and cultural dynamics of changes in production and consumption patterns.

2. Identifying barriers to and opportunities for change.

3. Evaluating possible future changes in consumption patterns and identifying the organizations or bodies which are most likely to influence them.

4. Producing a plan for action.

Source: Oxford Commission communication, December 1998.

69. The business community has recognized the social dimension of its performance. Companies, in particular multinationals, are increasingly working to improve their social and environmental corporate image. Some have experienced consumer boycotts in response to practices that have negative environmental and social effects. Such companies as Nike and Shell have drawn up codes of conduct and business principles after consumers, non-governmental organizations and media raised concerns over such issues as child labour, sweatshops, environmental damage and the support of dictators. Such issues as corporate social responsibility, John Elkington's triple bottom-line (economic, environmental and social performance),[26] and sustainable entrepreneurship are breaking new ground in both the business and policy-making communities.

C. Impacts on developing countries

70. There has been concern that policies and activities to promote sustainable production and consumption in developed countries may adversely affect economic development in developing countries by limiting exports from developing to developed countries. Those concerns relate particularly to environmental standards for products and production processes and eco-labelling, but also extend to environmental management standards, life cycle analysis, extended producer responsibility and eco-efficiency efforts. There is also concern that changes in consumption and production patterns in developed countries may

reduce the demand for some products from developing countries, including fossil fuels, minerals and other industrial raw materials.

71. Eco-labelling that requires certification with respect to international standards can pose major technical, administrative and financial difficulties for small and medium-sized enterprises (SMEs) in developing countries. Some technical cooperation programmes are providing assistance for this purpose.

72. Shifts in consumption patterns in developed countries can also offer new opportunities for exports from developing countries. A 1997 United Nations study presented cases in which developing country enterprises in the manufacturing, tourism, forest and agricultural sectors turned new environmental regulations, corporate practices and changes in consumer values to their advantage.[27] Development-oriented agencies, businesses and non-governmental organizations can also promote markets for sustainably produced products from developing countries. Sustainable development treaties between the Netherlands and Benin, Costa Rica and Bhutan have increased economic opportunities for those developing countries while promoting environmental protection and social development (see box 5).

73. Globalization of trade, investment, production and marketing are having major impacts on production processes in both developed and developing countries. The environmental impacts of the globalization process are complex and not well understood. On the one hand, there are concerns that production facilities for global markets will move to countries with low environmental standards, leading to environmental degradation at both the local and global levels. On the other hand, globalization often involves transfer of new, more resource-efficient and cleaner production technologies to developing countries. There is no agreement to date on the overall effect of these different forces.

74. Some international environmental agreements impose financial and technical burdens on developing economies and enterprises. In some cases, mechanisms have been established to reduce those burdens. The Montreal Protocol on Substances that Deplete the Ozone Layer, for example, contains provisions for financial assistance to developing countries through its Multilateral Fund. The Kyoto Protocol to the United Nations Framework Convention on Climate Change also provides for financial assistance to developing countries, as well as for a clean development mechanism to promote transfer of environmentally sound technology to developing countries, for which developed countries will receive greenhouse gas reduction credits toward meeting their commitments. The Global Environment Facility (GEF) provides funding for projects related to climate change and depletion of the ozone layer, as well as biodiversity and international waters.

75. In recent years, exports from developing countries have continued to increase faster than overall production, indicating that environmental protection issues are not currently having major adverse impacts on total exports from developing countries. However, prices of many minerals and other commodities crucial to the economies of some developing countries have declined in recent years, in part due to increased material efficiency and use of substitutes in developed countries, adversely affecting development in commodity-dependent economies. Further efforts are required to monitor the actual effect of changing production and consumption patterns in developed countries on development in developing countries, and to ensure that measures adopted in developed countries to promote sustainable production and consumption benefit both developing and developed countries.

Box 5
Sustainable coffee: cooperation between the Netherlands and Costa Rica

Coffee is an important trade product for both Costa Rica and the Netherlands. Coffee generates almost 25 per cent of the export earnings of Costa Rica, while the Netherlands, which is number four on the world list of coffee-consuming countries, imports five per cent of its coffee from Costa Rica. The sustainable development treaty between the two countries has provided a basis for an initiative to make the total coffee chain, from production to consumption, more supportive of sustainable development, including economic, social and environmental aspects. Parties at all stages in the production chain, including Costa Rican farming cooperatives, coffee-processing plants, and Netherlands coffee roasters and sales organizations, are participating in the programme, which focuses on three areas:

(a) Increasing the market for sustainable coffee;

(b) Protecting the environment and improving social conditions in coffee-producing areas;

(c) Strengthening information and accounting systems.

A survey of the market for sustainable coffee in the Netherlands has been carried out in cooperation with Netherlands coffee roasters and sales organizations. In Costa Rica, an environmental assessment has been carried out for five processing plants, and good housekeeping and technical environmental improvements are being carried out. In 1999, an environmental management system will be initiated for a second group of processing plants, based on ISO 14000. An inventory has been made of sustainability factors that are important to coffee farmers, and information systems are being developed for both individual companies and for the whole coffee chain.

Source: Fundecooperación, Costa Rica, and Ecooperation, the Netherlands, December 1998; for further information, contact: fundecop@sol.racsa.co.cr or: ecooperation@antenna.nl

D. National and local commitments

76. The need to change consumption and production patterns in order to ensure sustainable development has gained increasing attention at the national level from Governments, the business community, academic and research institutions, and non-governmental organizations. Many have initiated programmes over the past few years, in particular since UNCED, to change consumption and production patterns. The present section provides a selective review of such initiatives. More comprehensive information of national initiatives can be found on the Web site of the United Nations Division for Sustainable Development under the heading "National information", at: www.un.org/esa/agenda21/natlinfo/.

77. In 1998, the Swedish Government adopted environmental quality objectives for ecologically sustainable development. Supplementing earlier goals adopted in 1988 and

1991, the Government proposed 15 new quality goals to be achieved within one generation, i.e., by 2025. Those new goals and targets address such issues as cleaner air and water, eutrophication, acidification, sustainable forestry, landscapes, urban environments, climate change, toxic substances, radiation and protection of the ozone layer.[28]

78. A recent meeting organized by ECE and hosted by the Government of Austria discussed a wide variety of local initiatives (e.g. Riga, Apeldoorn, Krakow, Lyon) to promote more sustainable consumption in the European region. The meeting concluded that cities and communities are efficient starting points for promoting sustainable consumption because of the concentrations of consumers and producers, with the accompanying concentration of environmental impacts, facilitating the organization and motivation of consumers and producers. Most local initiatives focus on awareness-raising and improving efficiency in the use of energy, water and materials.[29]

79. Chile has established a number of targets for sustainable consumption and production to be achieved by 2011, based on work of its national environment commission. As part of that plan, the city of Santiago is developing and implementing a pollution prevention and clean-up plan for the metropolitan region, including improved public and private transport fleets, cleaner fuels, and controls on urban sprawl and industrial emissions. The plan also includes the introduction of toll-roads and elimination of parking lots to control urban traffic. In the early 1990s, Santiago introduced a bidding system for public transport route concessions with service requirements for the busiest areas.[30]

80. Guinea, a least developed country, restructured its water sector in 1989, with a public-private partnership assuming responsibility for planning, investments and management of the water supply. Through user charges and gradual expansion of the distribution system, 60 per cent of the population now has access to safe drinking water, in contrast to only 15 per cent in the early 1980s. The system has achieved full cost recovery in 10 years.[5]

81. Among OECD countries, increasing attention is being given to the environmental performance of Governments as consumers. Most OECD countries have begun to include environmental considerations into their operations and decision-making processes. Significant progress has been made in such areas as energy consumption, waste management, construction and building management, environmental management systems and greener government purchasing. There is a recognized need for further efforts towards the development of environmental management systems for Government agencies, government purchasing and investments, measuring and evaluating performance, and performance reporting.

Box 6
National and local initiatives towards sustainable consumption (Kabelvåg meeting)

Mumbai Grahak Panchayat, India
A collective purchasing scheme for 16,000 households is providing good quality food at low cost while generating environmental benefits.

Green Purchasing Network, Japan
Over 1,000 companies, public authorities and citizen groups are introducing practical guidelines for the purchase of more sustainable goods and services.

Pro-local supply, Austria
Municipalities are promoting local production for local consumption, improving the quality of life and reducing transportation.

Waste collection charge, Republic of Korea
A volume-based garbage fee is reducing waste generation and transforming the packaging industry.

Remanufacturing copiers, Xerox
Taking back old copiers and reusing components has reduced environmental impacts, waste and costs.

Trans-century environmental tour, China
A popular television programme is reaching a wide audience with features on good and bad environmental practices.

Town twinning, Belfort, France
A joint venture between Belfort, France, and Mohammedia, Morocco, is raising public awareness of sustainable development and environmental protection, stimulating participation in local policy-making and promoting solidarity across the Mediterranean.

Source: Kabelvåg workshop on consumption in a sustainable world, June 1998.

E. Consumer guidelines for sustainable consumption

82. In its resolution 39/248 of 9 April 1985, the General Assembly adopted the guidelines for consumer protection. The guidelines provide an internationally accepted framework for the development of national consumer protection policies, covering consumer health and safety, product standards, education, information, labelling and redress. Regional meetings held since 1985 have indicated that the guidelines provide a valuable framework for developing national consumer protection legislation and policies, in particular in developing countries.

83. Extension of the guidelines to include elements of sustainable consumption was recommended by the Commission on Sustainable Development at its third session, in 1995, endorsed by the Economic and Social Council in its resolution 1995/53. The process of

extending the guidelines started in January 1998 with an interregional expert group meeting at São Paulo, which proposed a set of new elements for inclusion in the guidelines. In late 1998, a series of informal intergovernmental consultations were held at the United Nations in preparation for consideration of the issue by the Commission at its seventh session.

84. A draft text of the extended guidelines, based on the report of the São Paulo meeting and the informal consultations, will be submitted to the Commission on Sustainable Development for consideration at its seventh session. The Commission will report to the Economic and Social Council at its substantive session of 1999 on its conclusions on the question. If the extended guidelines are adopted, this element of the Commission's work programme on changing consumption and production patterns will have been completed.

III. Future work

85. The issue of changing consumption and production patterns has been prominent on the international sustainable development agenda since 1992. The Commission's work programme on the issue, adopted in 1995, is in its fourth year of implementation. Both the scope and content of the debate have evolved rapidly, and new and innovative approaches are being introduced to the debate on a regular basis. The issue of consumption and production patterns has become, to some extent, an umbrella for general strategic issues and innovative approaches in the area of sustainable development policy-making. New concepts, policy instruments and approaches for changing unsustainable activities have often been analysed and assessed in this general process before being implemented at the sectoral, product or consumer level. The comprehensive review of the issue in 1999 is an opportunity to evaluate the progress on the work programme and identify priorities for the programme of work for the period 1999–2002.

86. The elements of the work programme, except perhaps for the extension of the guidelines for consumer protection, need further work, with some refocusing and incorporation of new priorities.

87. In the area of trends analysis, work should continue on monitoring trends in sustainable consumption and production and examining the policy implications of those trends. Efforts should be made to monitor progress on computer modelling of production and consumption patterns, and to promote the linking of climate change models to economic, demographic, environmental, health and education models in order to address broader sustainable development issues.

88. Efforts to gather, analyse and present data on trends in consumption and production patterns are ongoing, and will be focused to address the issues scheduled for consideration as a part of the Commission's work programme for 1998–2002. Critical trend analysis, policy assessment and modelling exercises will provide inputs to the Commission's work, and will provide a basis for detailed policy analysis, case studies, and advisory services. Further efforts are needed in the development and use of indicators for sustainable production and consumption.

89. A priority area for continuing work should be the evaluation of the effectiveness of various policy instruments for promoting sustainable consumption and production patterns. Case studies and databases should be developed and expanded to provide up-to-date information on the impacts of policies in both developing and developed countries. Consideration should be given to identifying effective mixes of regulations, economic instruments, education and information programmes, and government provision of complementary services and infrastructure.

90. Policy analysis should focus on policy packages that provide economic, social and environmental benefits through more resource efficient and cleaner production. Consideration should be given to assessing the benefits and costs of removing environmentally harmful subsidies and the effects of integrating environmental and social costs and benefits into market prices of goods and services. Consideration should be given to the rates at which environmental taxes can be phased in or environmentally harmful subsidies phased out, with minimum adverse impacts, and to measures for assisting social groups and enterprises that may be harmed by economic instruments or regulations.

91. Efforts to promote eco-efficiency and cleaner production, such as the UNEP/UNIDO cleaner production centres, should be supported. Obstacles to the dissemination of energy- and resource-efficient technologies, particularly to developing countries, should be identified and mechanisms developed to overcome them, including access to information on new technologies, financing for investment in efficient and clean technologies by small and medium-sized enterprises in developing countries, and technical assistance to assist in the transfer and adaptation process. Efforts to identify further potential for eco-efficiency improvements, such as the factor 4/10 initiative, should be pursued.

92. Governments, local authorities, the United Nations and other international organizations should improve their own environmental performance through policies and actions on procurement and operations. The UNDP "Green" Office Initiative should be considered as a model for other offices of the United Nations system and other organizations.

93. Cooperation between the business community, Governments, international organizations and non-governmental organizations in promoting sustainable production and consumption should be encouraged. Business and industry should be encouraged to go beyond compliance on a voluntary basis, and the role of voluntary initiatives by industry and public-private negotiated agreements should be examined. The Commission should review the results of the meeting on voluntary initiatives to be held at Toronto in March 1999 and consider what follow-up activities might be undertaken.

94. Considering the decentralized nature of consumer decision-making, national and international networks for sustainable consumption should be promoted for exchanging information and coordinating efforts towards sustainable consumption. Such networks should include consumer and environmental organizations, Governments and local authorities, businesses, educators and writers, making use of mass media, educational institutions, electronic communications and other media. The work of the Oxford Commission on Sustainability should be a valuable contribution to future work in this area.

95. Further study is needed of the impacts on developing countries of changing consumption and production patterns in developed countries. Those studies should include the impacts of eco-labelling and other environmental standards, as well as of changing consumer demand for new products and services. Consideration should be given to how developing countries can benefit from the changes and how they can introduce new technologies to meet changing consumer and producer demands.

96. Another important question requiring further work is the integration of sustainability considerations into other areas of decision-making in both the public and private sector. Despite increasing efforts to implement policies for sustainable production and consumption, some of those efforts have been offset by policies and management decisions in other areas, such as land use planning, urban development, agriculture, transportation, infrastructure, and fiscal and economic policies.

97. An important aspect of policy integration is the involvement of a variety of stakeholders in the planning and decision-making process. Policy development in the 1990s

has seen a revolution in involvement of stakeholders and the general public. This trend is likely to continue, and should be stimulated at the local, national and international levels. Consensus building and mutual understanding of arguments and priorities among all actors can make implementation of policy and achievement of goals more effective and efficient.

98. An important issue, not adequately addressed by the existing work programme, is the effect of the mass media, marketing and sociocultural trends in consumption patterns. For effective policy development, there is a need for a better understanding of the factors shaping consumer choice and behaviour, including traditions, norms and social values.

99. At its nineteenth special session, the General Assembly concluded that the focus of policy-making on sustainable consumption and production should shift from conceptual work to implementation. The upcoming period will focus on identifying and disseminating lessons learned in all regions of the world that can be implemented now. The exchange of information on experiences of policy implementation and cases of best and worst practice will support effective actions by Governments and major groups.

100. To carry out this work programme, with a focus on implementation, the Commission on Sustainable Development and the Secretariat will need to work closely with other organizations, in particular with UNDP, UNEP, UNIDO, the United Nations Conference on Trade and Development and other concerned bodies of the United Nations system, and with other international organizations, Governments and major groups.

101. The future work of the Commission, leading up to the 10-year review of UNCED in 2002, will consider consumption and production patterns as an overriding issue. It will therefore be considered in the context of the resource management, cross-sectoral and economic sector themes on its work programme.

102. Changing consumption and production patterns to ensure sustainability need not imply a decrease in quality of life or living standards. On the contrary, if existing consumption and production patterns persist, further development will be hampered and the quality of life will decrease. Changing consumption and production patterns for the benefit of all people and all countries is increasingly urgent to secure prosperity, improve quality of life, provide equal access to education and health services, and ensure a high quality environment for all. The future work of the United Nations on the issue should be focused on achieving that goal.

Notes

[1] See General Assembly resolution S-19/2, see in particular para. 28 and appendix.

[2] See *Official Records of the Economic and Social Council, 1995, Supplement No. 12* (E/1995/32), para. 45.

[3] See "Oslo Ministerial Round Table: elements for an international work programme on sustainable production and consumption", Oslo, 1995.

[4] A tenfold increase in resource productivity in industrialized countries in the long term, and a fourfold increase in 20 or 30 years; see General Assembly resolution S-19/2, para. 28 (f).

[5] New York, Oxford University Press, 1998.

[6] See "Consumption in a sustainable world", report of a workshop held at Kabelvåg, Norway, 2–4 June 1998 (Oslo, Ministry of Environment, and London, International Institute for Environment and Development, 1998).

[7] At www.eco.gr.jp.

[8] *Green Business Opportunities* (New Delhi), vol. 4, No. 4 (Oct–Dec 1998).

[9] See Emily Matthews and Allen Hammond, *Critical Consumption Trends and Implications: Degrading Earth's Ecosystems* (Washington, D.C., World Resources Institute, forthcoming).

[10] Based on data of the Food and Agriculture Organization of the United Nations (FAO) accessed at www.fao.org.

[11] See International Energy Agency, *World Energy Outlook 1996* (Paris, 1996).

[12] See *Technology Partnership Initiative*, No. 19 (October 1998), special feature.

[13] See World Resources Institute, *World Resources 1998–1999: Environmental Change and Human Health* (New York, Oxford University Press, 1998).

[14] See OECD, *Evaluating Economic Instruments for Environmental Policy* (Paris, 1997); and Economic Commission for Europe (ECE), *Role of Economic Instruments in Integrating Environmental Policy with Sectoral Policies* (Geneva, 1998).

[15] See European Environment Agency, *Environmental Taxes: Implementation and Environmental Effectiveness*, Environmental Issues Series, No. 1 (Copenhagen, 1996); OECD, *Environmental Taxes and Green Tax Reform* (Paris, 1997); and OECD, *Implementation Strategies for Environmental Taxes* (Paris, 1996).

[16] See Norman Myers and Jennifer Kent, *Perverse Subsidies: Tax Dollars Undercutting Our Economies and Environments Alike* (Winnipeg, International Institute for Sustainable Development, 1998); and David Malin Roodman, *The Natural Wealth of Nations: Harnessing the Market for the Environment* (New York, W. W. Norton, 1998).

[17] See WBCSD, *Sustainability through the Market: A Business Based Approach to Sustainable Consumption and Production* (Geneva, December 1998).

[18] See "Sustainable consumption and production: clarifying the concepts", report of the Rosendal meeting (Paris, OECD, 1997).

[19] OECD, *Voluntary Approaches for Environmental Policy in OECD Countries* (Paris, 1998).

[20] See Netherlands Ministry of Environment, *Silent Revolution: Dutch Industry and Dutch Government Working Together for a Better Environment* (The Hague, 1998).

[21] See *Tomorrow: Global Environment Business*, vol. 8, No. 6 (November–December 1998).

[22] See United Kingdom Department for Environment, Transport and Regions, "Sustainability counts", consultation paper on a set of "headline" indicators of sustainable development (London, November 1998).

[23] See *Down to Earth* (Delhi, Centre for Science and Environment), vol. 10, No. 5 (1996).

[24] See UNDP, "The 'Green' Office Initiative" (New York, 1995).

[25] See Marine Stewardship Council information package, London, 1998, information also available at www.msc.org.

[26] See John Elkington, *Cannibals with Forks: The Triple Bottom Line for Twentieth Century Business* (Oxford, Capstone, 1997).

[27] International Institute for Environment and Development and United Nations, *Unlocking Trade Opportunities* (New York, May 1997).

[28] See Sweden, Ministry of Environment, *Swedish Environmental Quality Objectives: A Summary of the Swedish Government Bill 1997/1998: 145* (Stockholm, 1997).

[29] See Austrian Federal Ministry of Environment, Youth and Family Affairs, "Encouraging local initiatives towards sustainable consumption patterns", proceedings of an ECE workshop held at Vienna from 2 to 4 February 1998.

[30] See Stefan Larenas, *Globalization and Changes in the Patterns of Consumption in Chile* (Santiago, Consumers International Regional Office for Latin America, 1997).